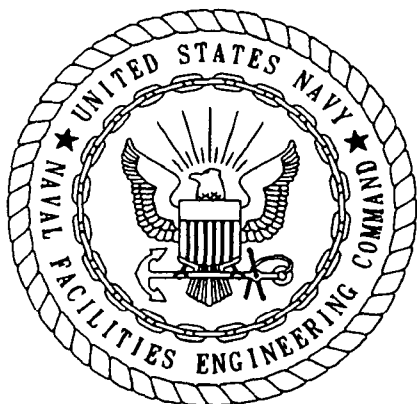


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MONITORING ONLY PLAN

FACILITY 327

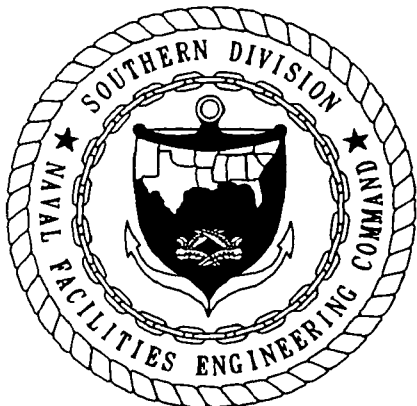
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PANAMA CITY, FLORIDA**

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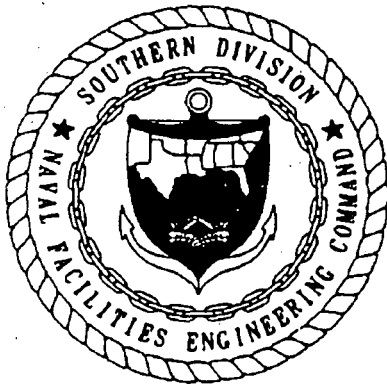
CLEAN - DISTRICT I

CONTRACT NO. N62467-89-D-0317

DECEMBER 1993



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010**



FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40 CFR 281 (*Approval of State Underground Storage Tank Programs*). Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This plan was prepared to satisfy the requirements of Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*) regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Commanding Officer, Coastal Systems Station (CSS), Panama City, Florida, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Luis Vazquez, Code 1843, at AUTOVON 5630613 or (803)743-0613.

ACKNOWLEDGMENTS

In preparing this plan, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy group at ABB Environmental Services, Inc., commends the support, assistance, and cooperation provided by the personnel at Coastal System Station, Panama City, Florida, and Southern Division, Naval Facilities Engineering Command.

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Panama City, Florida

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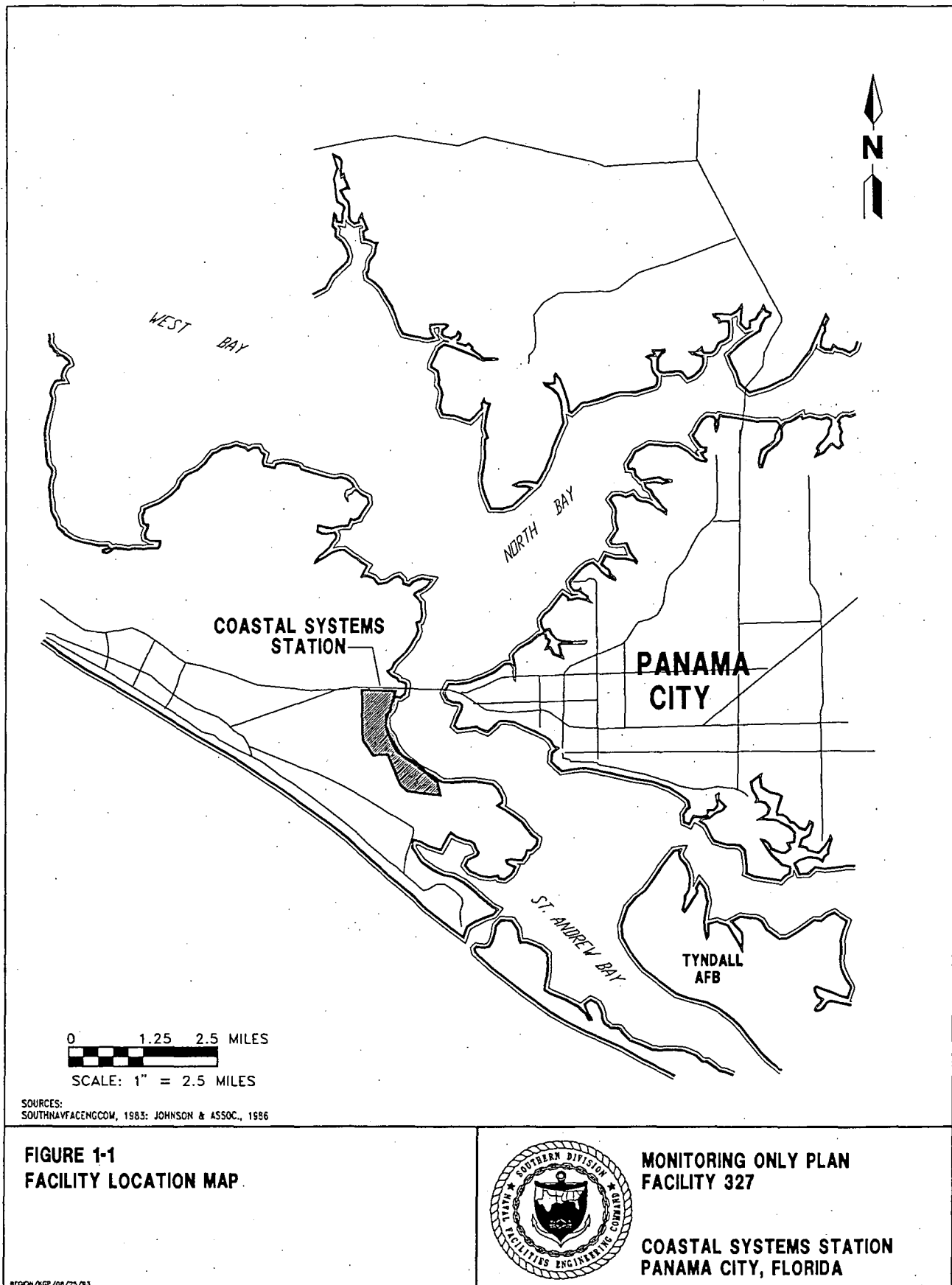
GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CSS	Coastal Systems Station
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulations
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
ft/day	feet per day
ft/ft	feet per foot
HSWA	Hazardous and Solid Waste Amendments
ID	inside diameter
MOP	Monitoring Only Plan
MTBE	methyl tert-butyl ether
µg/l	micrograms per liter
OVA	organic vapor analyzer
ppb	parts per billion
ppm	parts per million
QAP	Quality Assurance Plan
RCRA	Resource Conservation and Recovery Act of 1976
SOUTHNAV- FACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOA	volatile organic aromatic

1.0 INTRODUCTION

Coastal Systems Station (CSS) Panama City, Florida, is one of seven major research, test, and evaluation laboratories of the Space and Naval Warfare Systems Command. CSS Panama City is located on St. Andrew Bay in Bay County, Florida (Figure 1-1). CSS Panama City is bounded by U.S. Highway 98 to the north, St. Andrew Bay to the east, State Road 392B (Magnolia Beach Road) to the south, and State Road 392 (Thomas Drive) to the west. Facility 327 is located on the east side of the base next to St. Andrew Bay (Figure 1-2).

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to prepare a Monitoring Only Plan (MOP) for conducting quarterly sampling of select monitoring wells at Site 327 at CSS Panama City. The scope and manner for implementing the MOP are presented herein.



COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



ST. ANDREW BAY

SITE 327

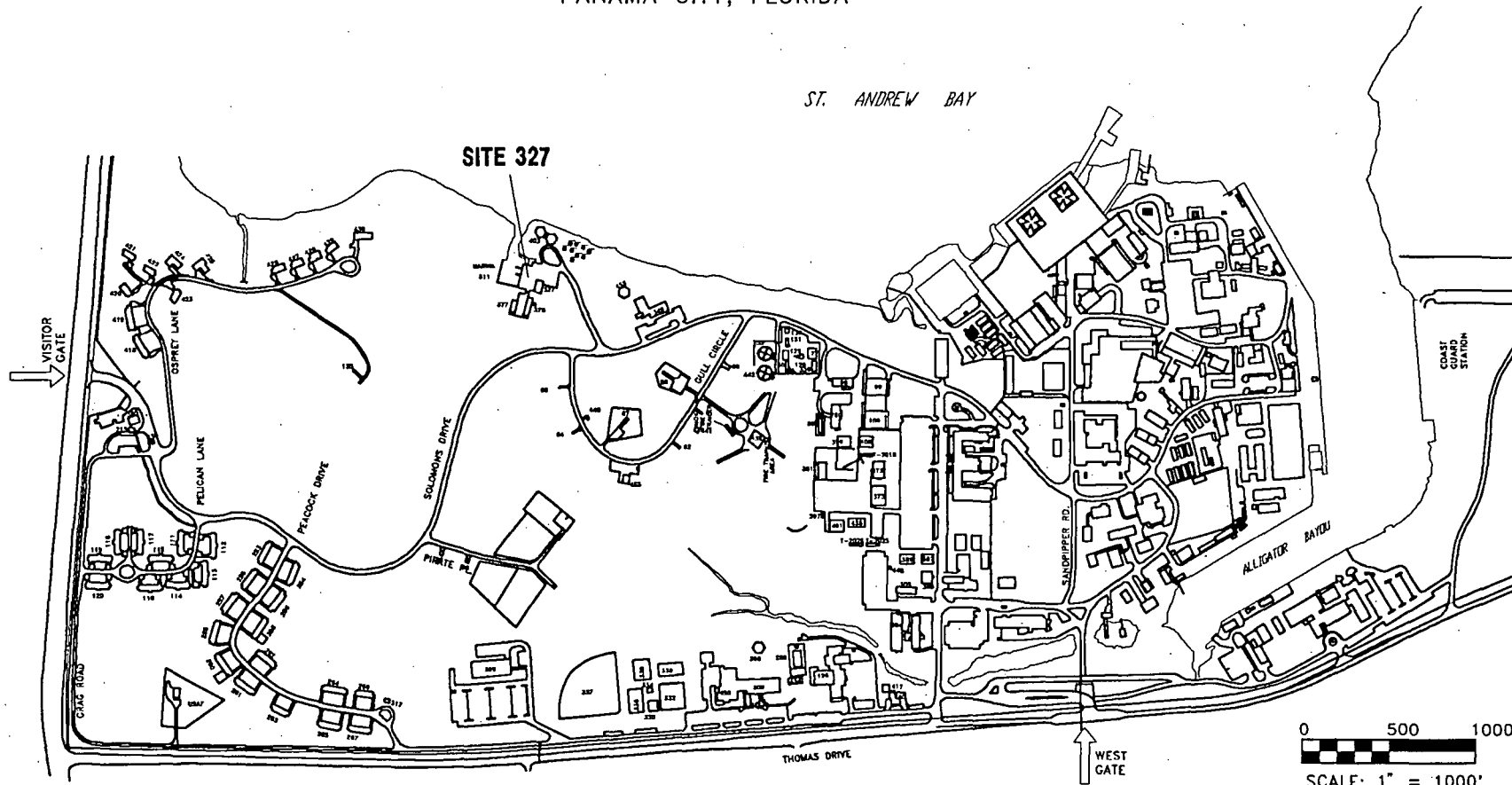


FIGURE 1-2
SITE LOCATION MAP



MONITORING ONLY PLAN
FACILITY 327

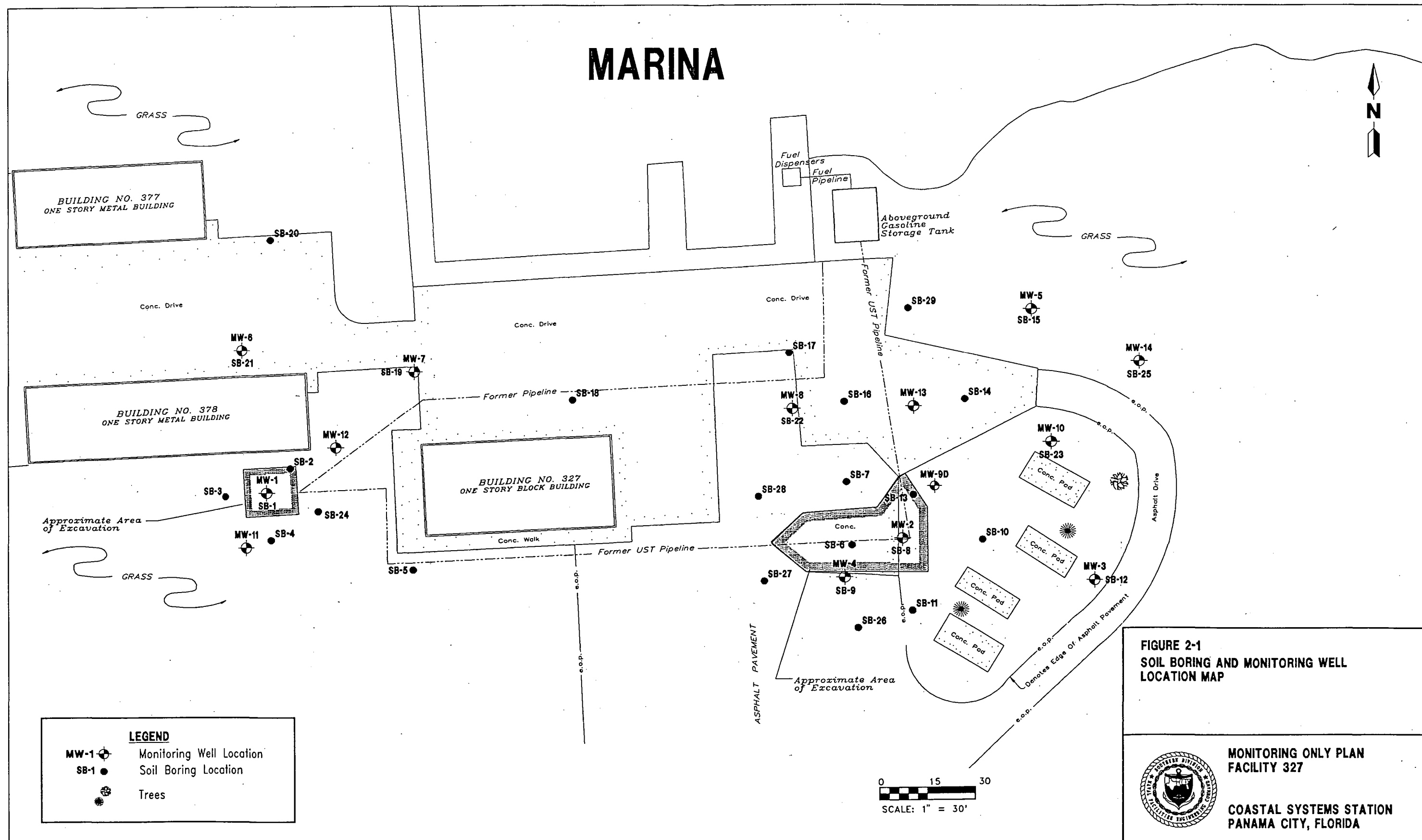
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION. Facility 327 is a pleasure-craft marina located on the east side of the base next to St. Andrew Bay (Figure 1-2). The site is the former location of a 2,000-gallon fiberglass underground storage tank (UST) that contained gasoline to be used by boats at the marina. The UST and approximately 200 linear feet of associated piping that extended along the south side of Building 327 were removed in August 1991. The UST was replaced with one aboveground storage tank positioned next to the boat ramp. The UST had been buried in a grassy area on the south side of Building 378 approximately 10 feet from the side of the building. The pipeline ran from the tank to the southwest corner of Building 327, along the south side of Building 327 to an elbow, then northeast to the boat ramp. The pipeline was buried under a concrete and asphalt parking area from Building 327 to the boat ramp.

2.2 SITE HISTORY. Facility 327 has been in operation at CSS Panama City for approximately 9 years. A 2,000-gallon fiberglass UST that contained gasoline for use at the base marina was installed in 1985. The site, former UST location, and associated piping are shown in Figure 2-1. The fuel was conveyed to a dispenser at the boat ramp by underground pipelines. There are two abandoned pipelines that were associated with the tank at the site. One runs from the former tank location along the north side of Building 327 to the dispenser. The time of, and reason for, abandonment of this pipeline is unknown. It was replaced by a pipeline that runs from the tank location along the south side of Building 327, across the paved area, then turns north to the dispenser. This second pipeline was abandoned some time prior to mid-1990 following the discovery of a leak in the vicinity of the elbow at the edge of the pavement in the Marina driveway where the piping turns to the north. CSS Panama City personnel notified the local Florida Department of Environmental Protection (FDEP) office of the release and were instructed to remove contaminated soil and groundwater from the site. At that time, base personnel contracted to have an undetermined amount of contaminated soil at the leak location removed and approximately 1,000 gallons of gasoline and contaminated groundwater pumped from the excavation and disposed. The contractor did not provide base personnel with manifests for transport or disposal of the contaminated soil and groundwater, nor was the activity provided with a report of the remedial action. The UST and pipeline were taken out of service after the release. Confirmational sampling was not performed following soil removal at the leak location. The UST was removed in August 1991, and soil and groundwater contamination was discovered at that time.

On June 8, 1992, Terra Resources collected soil samples from the area of the former UST. The samples were analyzed for total organic soil vapors with a flame ionization detector (FID). One temporary monitoring well was installed at the location of the former UST. A groundwater sample was collected from the temporary well and sent to an FDEP-certified laboratory to be analyzed for volatile organic aromatics (VOAs), xylenes, and methyl tert-butyl ether (MTBE). In addition, six soil samples were collected along the area of the former fuel pipeline for analysis of soil vapor levels with an FID. Groundwater analytical results indicated 158 parts per billion (ppb) benzene and 1,320 ppb total VOA compounds in samples from the temporary well. Soil sample results indicated excessively contaminated soil (greater than 500 parts per million [ppm] organic



vapors) at two locations in the area of the former UST. The excessively contaminated soil warranted further site investigation pursuant to Chapter 17-770, Florida Administrative Code (FAC).

2.3 PREVIOUS INVESTIGATION. ABB-ES was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment at Site 327. A contamination assessment was conducted from February through May 1993. A Contamination Assessment Report (CAR) was submitted to FDEP in July 1993 (ABB-ES, 1993).

Twenty-nine soil borings were drilled at the site to assess the extent and levels of soil petroleum contamination (see Figure 2-1). Based on the results of the soil boring program, nine, 2-inch inside diameter (ID), monitoring wells (CSS-327-1 through CSS-327-9D; designated as MW-1 through MW-9D in figures and tables) were installed at the site. After discussions with FDEP, a decision was made to install five additional wells at the site (CSS-327-10 through CSS-327-14; designated as MW-10 through MW-14 in figures and tables). All shallow wells at the site were screened with 10 feet of slotted screen to a depth of 11 to 12 feet below land surface (bls). One deep well, CSS-327-9D (MW-9D), was installed to a depth of 18.20 feet bls with a screen interval of approximately 13 to 18 feet bls. Monitoring well locations are shown in Figure 2-1.

Groundwater samples were collected from monitoring wells CSS-327-1 through CSS-327-9D on March 9, 1993. The samples were sent to Wadsworth/ALERT Laboratories, Tampa, Florida, to be analyzed for constituents of the gasoline analytical group. Laboratory results from the March 9, 1993, sampling event are shown in Table 2-1. Figure 2-2 shows the distribution of VOAs detected in the groundwater samples.

On May 18, 1993, monitoring wells CSS-327-1, CSS-327-2, CSS-327-5, and CSS-327-9D, were resampled, along with newly installed monitoring wells CSS-327-10 through CSS-327-14. The samples were sent to Wadsworth/ALERT Laboratory to be analyzed for constituents of the gasoline analytical group. Laboratory results from the May 18, 1993, sampling event are shown in Table 2-2. Figure 2-3 shows the distribution of VOAs detected in the groundwater samples.

Table 2-1
Summary of Groundwater Sample Laboratory Analyses,
March 9, 1993

Monitoring Only Plan
Site 327, Coastal Systems Station
Panama City, Florida

Compound	Method Detection Limit	State Target Level or Guidance Concentration	MW 01	MW 02	DUP MW2	MW 03	MW 04	MW 05	MW 06	MW 07	MW 08	MW 09D
Benzene	1	¹ 1	58	ND	ND	ND	ND	6	ND	ND	ND	ND
Ethylbenzene	1		4	4	6	ND	ND	2	ND	ND	ND	ND
Toluene	1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	1		1	17	23	ND	6	1	ND	ND	ND	ND
Total VOA ²	1	¹ 50	63	21	29	ND	6	9	ND	ND	ND	ND
MTBE	1	¹ 50	29	ND	ND	ND	ND	ND	ND	ND	ND	ND

¹State target level, Chapter 17-770, Florida Administrative Code [FAC]).

²Total VOA is the sum of all benzene, ethylbenzene, toluene, and xylenes.

Notes: Concentrations are in parts per billion.

DUP = duplicate sample.

ND = not detected.

VOA = volatile organic aromatics.

MTBE = methyl tert-butyl ether.

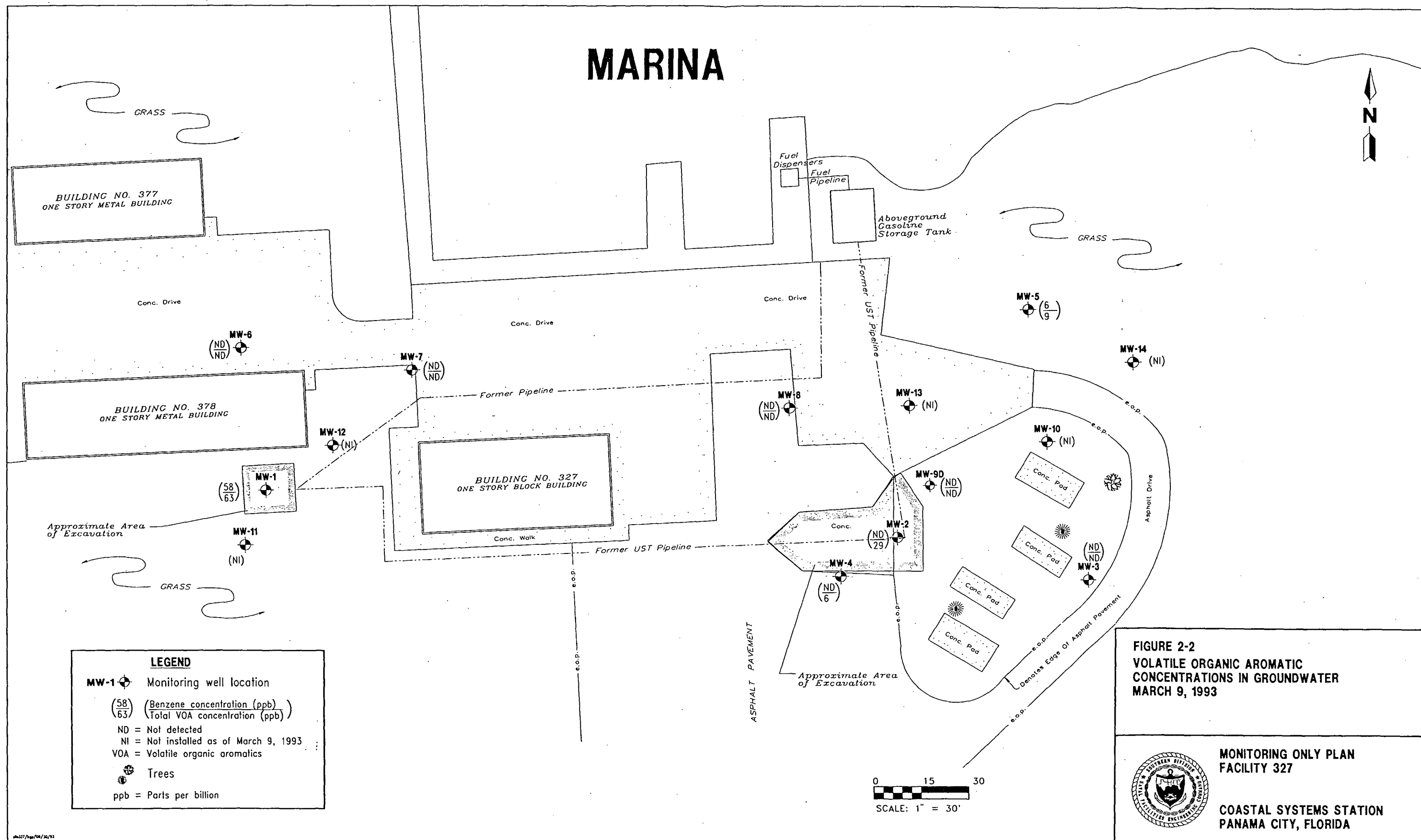


Table 2-2
Summary of Groundwater Sample Laboratory Analyses,
May 18, 1993

Monitoring Only Plan
Site 327, Coastal Systems Station
Panama City, Florida

Compound	Method Detection Limit	State Target Level or Guidance Concentration	MW 01	DUP MW1	MW 02	MW 05	MW 9D	MW 10	MW 11	MW 12	MW 13	MW 14
Benzene	1	¹ 1	2	2	ND	ND	ND	ND	ND	ND	4	ND
Ethylbenzene	1		ND	ND	2	ND	ND	ND	ND	ND	31	ND
Toluene	1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	1		ND	ND	5	ND	ND	ND	ND	ND	16	ND
Total VOA ²	1	¹ 50	2	2	7	ND	ND	ND	ND	ND	51	ND
MTBE	1		7	7	ND	ND	ND	ND	ND	ND	5	ND
Chloroform	1		ND	ND	ND	ND	ND	4	ND	ND	ND	ND
Lead	5	¹ 50	25	22	21	8	11	12	19	10	6	15

¹State target level, Chapter 17-770, Florida Administrative Code [FAC]).

²Total VOA is the sum of all benzene, ethylbenzene, toluene, and xylenes.

Notes: Concentrations are in parts per billion.

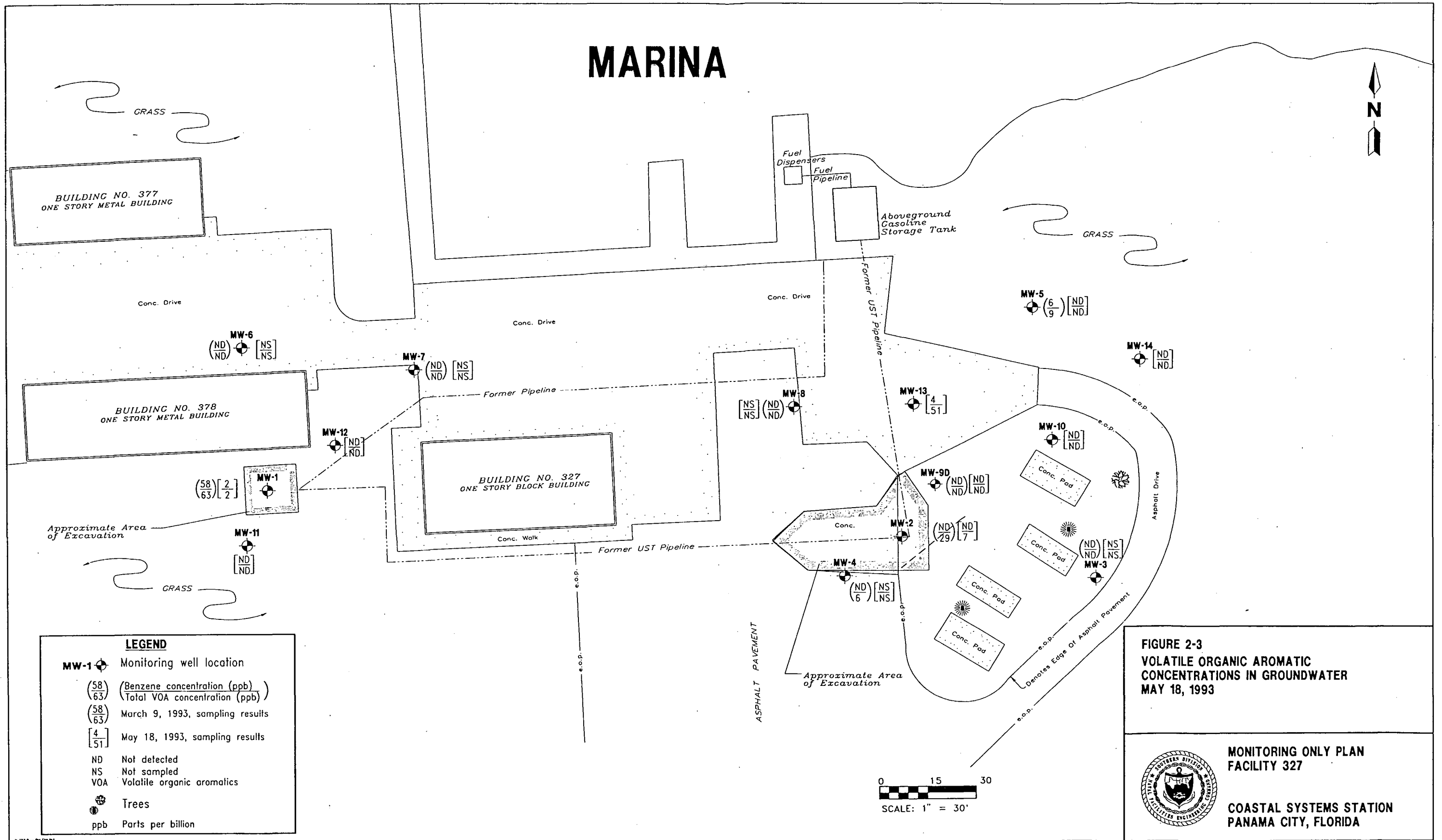
DUP = duplicate sample.

ND = not detected.

VOA = volatile organic aromatics.

MTBE = methyl tert-butyl ether.

MARINA



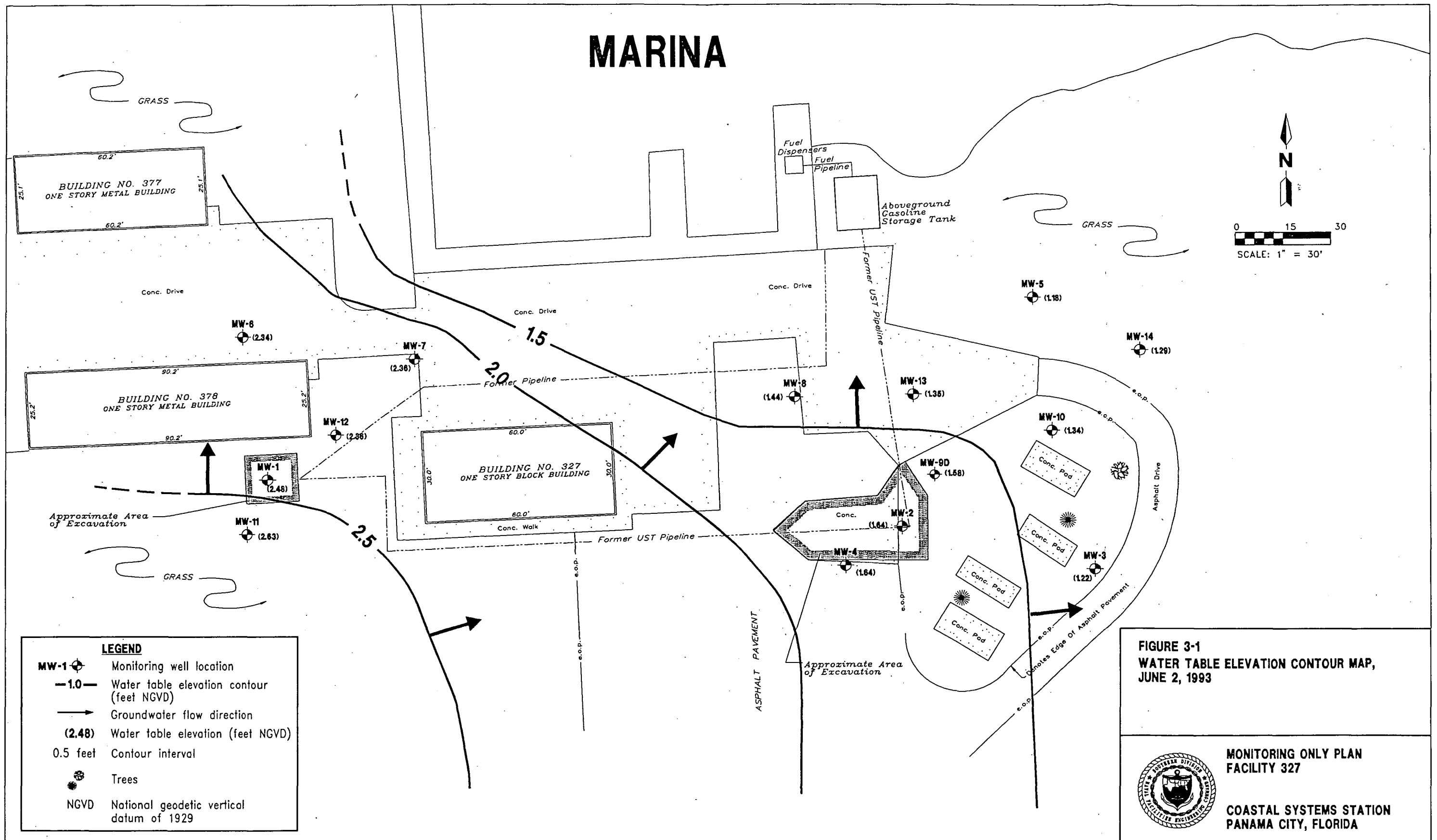
3.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The following is a summary of conditions at the site, which are described in the CAR (ABB-ES, 1993).

- Sediments encountered in the unsaturated zone and water-table aquifer during onsite drilling operations are predominantly gray to black, fine- to medium-grained quartz sand.
- The water table beneath the site was encountered at depths ranging between 1 and 3 feet bls.
- The direction of groundwater flow in the water table aquifer is generally to the north and east (Figure 3-1).
- Excessive soil contamination as indicated by headspace organic vapor analysis was identified in soil borings SB1, SB14, SB16, and SB18. Most of the areas identified as having excessively contaminated soil are covered by asphalt and concrete.
- Gasoline analytical group compounds detected in groundwater samples only slightly exceeded Chapter 17-770, FAC, target levels for those compounds. Compounds detected in groundwater samples include benzene, ethylbenzene, xylenes, methyl tert-butyl ether, chloroform, and lead.
- The vertical extent of contamination, as assessed by deep monitoring well CSS-327-9D, does not exceed 14 feet bls.
- The apparent sources of contamination, the 2,000-gallon gasoline UST and the former fuel pipelines, have been removed from the site or abandoned in place.
- No potable water sources were identified within a 0.25-mile radius of the site. There appears to be no risk of contamination of the CSS Panama City public water supply system from activities at the site.

A Monitoring Only Plan is recommended for Site 327 based on the following findings and conclusions of the contamination assessment.

- Organic vapor analyses indicate soil contamination is confined to relatively small areas in the vicinities of monitoring wells CSS-327-1 and CSS-327-13.
- Comparison of data from the March 9, 1993, and May 18, 1993, sampling events indicates that contaminant levels are decreasing. The concentration of benzene in CSS-327-1 decreased from 58 ppb to 2 ppb. The total VOA concentration decreased from 63 ppb to 2 ppb. The benzene concentration in CSS-327-5 also decreased from 6 ppb to less than 1 ppb. The total VOA concentration in CSS-327-5 decreased from 9 ppb to less than 1 ppb.



- The horizontal and vertical extent of soil and groundwater contamination at the site does not appear to be significant and is not anticipated to affect local potable water supplies on the base.
- Groundwater contaminants do not appear to be migrating from the site, and were detected in concentrations that are not anticipated to present a significant health or environmental concern at the site.

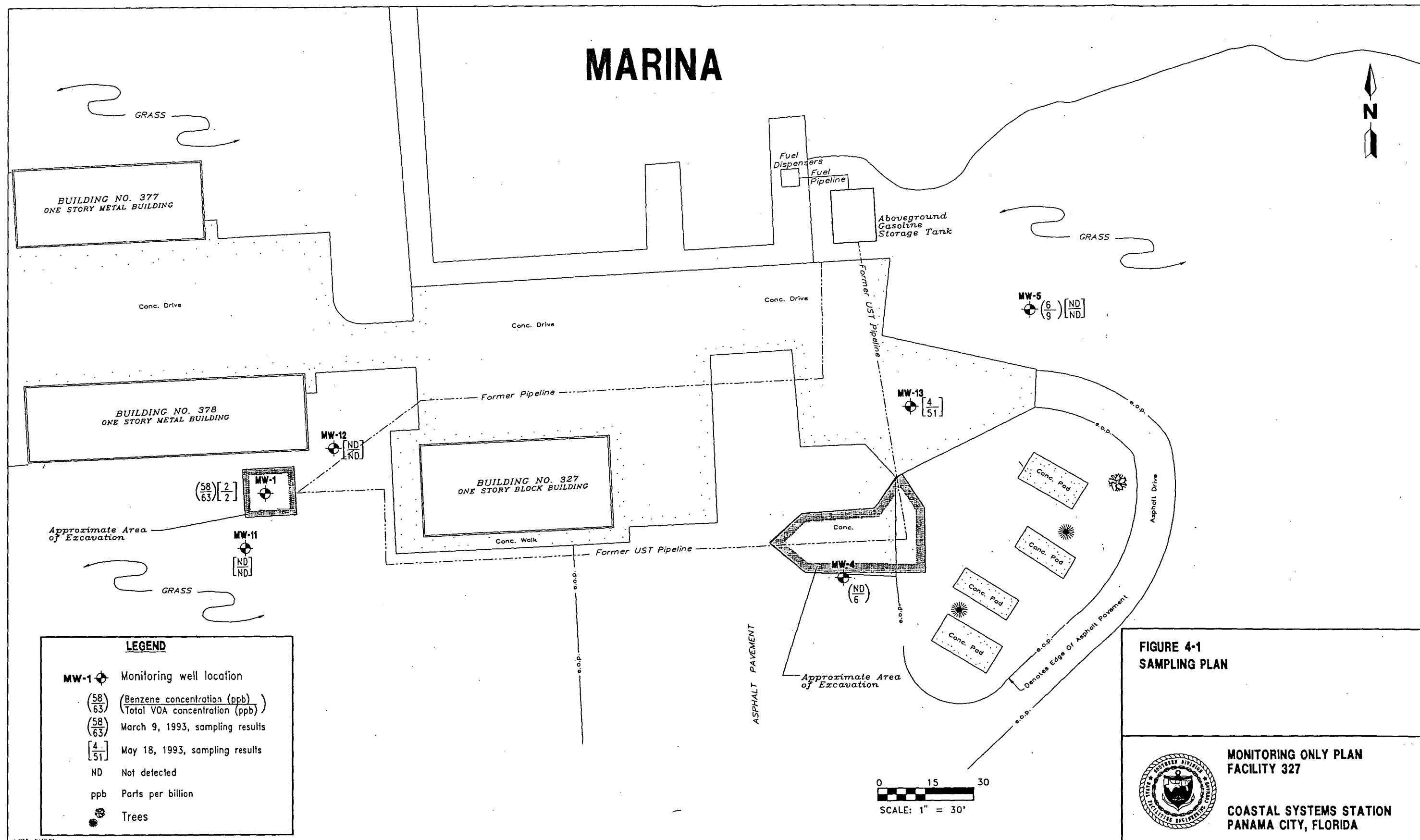
4.0 MONITORING ONLY PLAN (MOP)

The MOP would require the following:

- quarterly groundwater sampling of three wells located near the former UST, CSS-327-1 (source), CSS-327-11 (upgradient), and CSS-327-12 (downgradient), for a period of 1 year (Figure 4-1);
- quarterly groundwater sampling of three wells located near the former pipeline leak, CSS-327-4 (upgradient), CSS-327-5 (downgradient), and CSS-327-13 (source), for a period of 1 year (Figure 4-1);
- analyses of groundwater samples by U.S. Environmental Protection Agency (USEPA) Method 601/602; and
- submittal of quarterly analytical results in a written report to FDEP within 60 days of sample collection. The final quarterly report would summarize the year's sampling events.

At the end of the monitoring period, groundwater contaminant levels are expected to decrease to the following levels. If not, additional monitoring, supplemental assessment, and/or remediation may be required.

- Total VOA concentrations should decrease to less than 50 micrograms per liter ($\mu\text{g}/\text{l}$) for samples collected from the six monitoring wells of concern.
- Benzene concentrations should decrease to less than 1 $\mu\text{g}/\text{l}$ for samples collected from the six monitoring wells of concern.



5.0 GROUNDWATER MONITORING METHODOLOGIES AND EQUIPMENT

The following methodologies and equipment will be used to implement the MOP.

5.1 GROUNDWATER LEVEL MEASUREMENTS. Groundwater levels from each existing monitoring well at the site will be measured using an electric water level indicator and an engineering tape with divisions in increments of 0.01 foot. Groundwater level elevations will be calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing. Top of casing measurements will be referenced to an arbitrary benchmark. A groundwater flow direction map will be constructed using groundwater elevation data.

5.2 GROUNDWATER SAMPLING AND ANALYSES. Groundwater samples will be collected in accordance with a FDEP-approved Quality Assurance Plan (QAP). Each monitoring well will be purged with a Teflon™ bailer until a minimum of five well volumes have been removed from the well. Groundwater samples will be collected using an extruded Teflon™ bailer. A duplicate sample, equipment blank, and trip blank will also be collected. The samples will be placed into appropriate containers, properly preserved, and stored on ice. Samples will be shipped to an FDEP-approved analytical laboratory. All groundwater samples collected will be analyzed by USEPA Methods 601 and 602.

5.3 WRITTEN REPORT PREPARATION. A written report will be prepared and submitted to SOUTHNAVFACENGCOM and FDEP within 60 days of each quarterly sampling event. The report will discuss the groundwater sampling analytical results and recommendations (if any), as well as present a brief review of site background information and site conditions. Site location maps, locations of monitoring wells, and groundwater contamination maps will be included with the reports.

REFERENCES

ABB Environmental Services, Inc., 1993, Contamination Assessment Report, Facility 327, Coastal Systems Station Panama City: Tallahassee, Florida.

Florida Department of Environmental Regulation, May 1992, Guidelines for assessment and remediation of petroleum contaminated soils, revised: Division of Waste Management.